REMARKS

Summary of the Office Action

In the non-final Office Action mailed on August 11, 2008, the Examiner objected to the specification for failing to provide proper antecedent basis for a "computer readable medium" as claimed.

The Examiner rejected claims 1-56 on the grounds of nonstatutory double patenting over:

claims 1-62 ("the '701 claims") of U.S. Patent No. 7,020,701 ("the '701 Patent"),

claims 1-55 ("the '831 claims") of U.S. Patent No. 6,859,831 ("the '831 Patent"),

claims 1-61 ("the '251 claims") of U.S. Patent No. 6,832,251 ("the '251 Patent"),

claims 1-68 ("the '607 claims") of U.S. Patent No. 6,826,607 ("the '607 Patent"),

claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 ("the '387 claims"), of U.S. Patent App. No. 09/684,387 ("the '387 Application"), and

claims 1-32, 34-63, 65-81, 91, 92, 94, 95, 97, 99-101, 103, 106, and 108-119 ("the '706 claims") of U.S. Patent App. No. 09/684,706 ("the '706 Application").

The Examiner rejected claims 1-6, 8, 14-24, 30, 34, 39-45, 48, 49 and 52-56 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,414,955 ("Clare") in view of Wesson et al., "Network Structures for Distributed Situation Assessment", IEEE Transactions on Systems, Man, and Cybernetics, Vol. 11, No. 1, pp. 5-23 ("Wesson").

The Examiner rejected claims 7, 9-13, 33, 35, and 36 under 35 U.S.C. § 103(a) as being unpatentable over Clare-Wesson in view of U.S. Patent No. 6,546,419 ("Humpleman").

The Examiner rejected claims 25-29, 31, 32, 46, 47, 50, and 51 under U.S.C. § 103(a) as being unpatentable over Clare-Wesson in view of U.S. Patent No. 6,615,088 ("Myer").

The Examiner rejected claim 37 under 35 U.S.C. § 103(a) as being unpatentable over Clare-Wesson in view of U.S. Patent No. 5,742,829 ("Davis").

The Examiner rejected claim 38 under 35 U.S.C. § 103(a) as being unpatentable over Clare-Wesson in view of U.S. Patent Pub. No. 2002/0154631 ("Makansi").

Status of the Claims

Currently pending are claims 1-56, of which claims 1, 46, 48, 49, 50, 51, 54, and 56 are independent and the remainder are dependent. In this response, Applicant has amended claims 1-7, 9-10, 12-14, 17-18, 20-25, 27, 29, 32-54, and 56. Support for these amendments may be found generally throughout the specification and specifically as indicated below.

Response to Objections to the Specification

The Examiner objected to the specification for failing to provide proper antecedent basis for a "computer readable medium" as claimed.

In response, Applicant notes that the originally filed specification included claims that recited a computer readable medium as currently claimed, such as claim 48 which, as originally filed recited in part:

"A computer readable medium containing executable instructions which, when executed in a processing system, cause the processing system to collect and process data in a sensor network…"

Applicant further notes that originally filed claim 50 recited the same preamble. As such, Applicant submits that recitation of a "computer readable medium" is supported by the specification as filed generally and specifically by at least the disclosure of claims 48 and 50 and thus has proper antecedent basis. Applicant therefore respectfully requests the Examiner withdraw the objection to the specification.

Response to Claim Rejections

1. Claim 1 is not unpatentable over Clare in view of Wesson as the cited art does not disclose organization of a plurality of network elements by flooding an assembly packet as recited in claim 1.

Claim 1 was rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over Clare in view of Wesson. Applicant submits that claim 1, as amended is neither disclosed nor suggested by either Clare or Wesson, and thus is allowable over the cited art.

Claim 1 recites a method for operating a sensor network comprising a plurality of nodes, where the plurality of nodes includes at least one sensor node, and each sensor node comprises at least one sensor. Specifically, claim 1 recites, *inter alia,*

"organizing the plurality of nodes into a plurality of clusters by:

determining a cluster for a start node,

transmitting an assembly packet from the start node to each node neighboring the start node, wherein the assembly packet includes a cluster indication, and

upon reception of the assembly packet at a node,

determining a cluster for the node based on the cluster indication in the assembly packet,

modifying the cluster indication in the assembly packet, and

transmitting the assembly packet with the modified cluster indication to each node neighboring the node".

Support for these amendments may be found generally throughout the specification and specifically on at least page 17, line 22 – page 18, line 22 (general description of network with sensor nodes) and page 49, line 17 – page 52, line 10 of the specification (use of assembly packets in flooding algorithm). *See also* Figures 8-9 and 30-34.

Clare discloses a wireless network of communicating devices, including sensors, that uses a distributed method of topology learning to organize multiple hop, relayed communication among the devices and with users. Clare, Abstract. Clare describes that each deployed node has a maximum communication range *g*, a maximum interference range *b,* and a given power level, in which the deployed nodes operate using synchronous periodic time frames for scheduling. Clare, col. 6, lines 36-65. Clare states that it is "desirable for the invention that the relative locations of some nodes (at least one) be known initially". Clare, col. 7, lines 60-62. Clare assumes that some of the nodes are also in a "startup network", each startup network node having stored data about its own location. Clare, col. 8, lines 7-15. To help determine neighboring nodes and interfering nodes, Clare discloses that nodes preferably each have stored data regarding the "relative locations of all other member nodes within its maximum interference range *b*". Clare, col. 8, lines 15-18.

Clare discloses that the all of the nodes of the network, particularly the nodes of the startup network, (quasi-)periodically send out invitations to join the network. Clare, col. 8, lines 28-39. Non-member nodes (or "new nodes") are pre-programmed to occasionally listen for some number of periods for invitations. When a new node receives an invitation from a member node, the new node responds indicating the new node and the member node are neighbors. Clare, col. 8, line 49-52. Clare discloses that the network is scheduled so that no conflicts occur between communications. Clare, col. 8, line 56 – col. 9, line 1 and col. 9, lines 24-41.

The network determines a "potential interference range" for the new node based on the location of the member node communicating with the new node, the maximum communication range *g*, and the maximum interference range *b.* Clare, col. 9, lines 1-23. . The new node then determines a possible location or "potential communication range" of the new node based on both the maximum communication range *g* of the new node and the locations of member node that can communicate with the new node. Clare, col. 9, line 42 – col. 10, line 15. Then, based on the potential interference range and the potential communication range of the new node, the initial invitation is transmitted to the new node in

a non-interfering time slot and the relative locations of the new node and the member node are determined. Clare, col. 10, lines 16-51.

While Clare discloses organization of a network of nodes, Clare does not disclose or suggest use of an assembly packet or a cluster indication to organize the nodes, tracking which nodes have received the assembly packet, modifying the cluster indication, or transmitting the (modified) assembly packet to all nodes in the network.

Specifically, Applicant submits that Clare does not disclose or suggest, as recited in amended claim 1, "organizing the plurality of nodes into a plurality of clusters by: determining a cluster for a start node, transmitting an assembly packet from the start node to each node neighboring the start node, wherein the assembly packet includes a cluster indication, and upon reception of the assembly packet at a node, determining a cluster for the node based on the cluster indication in the assembly packet, modifying the cluster indication in the assembly packet, and transmitting the assembly packet with the modified cluster indication to each node neighboring the node".

Wesson discusses organizational structures for situation assessment tasks, such as solving a message puzzle task (MPT). Wesson, pg 6, col. 2 to pg. 7, col. 2. Wesson tested two different organizational structures on the MPT. Wesson, p. 7, col. 2 – p. 8, col. 1. The first is an anarchic committee (AC) structure organized along a cooperating experts paradigm where each node in a network can communicate with any (and all) other node(s) in the network. Wesson, p. 8, col. 1 and col. 2. The second is a dynamic hierarchical cone (DHC) structure organized such that nodes in a network communicate from a high-level node, through middle-level nodes, to low-level nodes along pre-defined pathways between the high-level node to the middle-level nodes, and between the middle-level nodes and the low-level nodes. Wesson, p. 8, col. 1 and col. 2.

While Wesson does describe sending data between multiple nodes in a network, Wesson does not disclose or suggest use of an assembly packet or a cluster indication to organize the nodes, tracking which nodes have received the assembly packet, modifying the cluster indication, or transmitting the (modified) assembly packet to all nodes in the network.

Specifically, Applicant submits that Wesson does not disclose or suggest, as recited in amended claim 1, "organizing the plurality of nodes into a plurality of clusters by: determining a cluster for a start node, transmitting an assembly packet from the start node to each node neighboring the start node, wherein the assembly packet includes a cluster indication, and upon reception of the assembly packet at a node, determining a cluster for the node based on the cluster indication in the assembly packet, modifying the cluster indication

in the assembly packet, and transmitting the assembly packet with the modified cluster indication to each node neighboring the node".

Applicant therefore submits that claim 1 is allowable over the cited art and thus respectfully requests the Examiner withdraw the rejection of claim 1 under 35 U.S.C. § 103(a).

2. Claims 46, 48, 49, 50, 51, 54, and 56 each are not unpatentable over Clare in view of Wesson as the cited art does not disclose organization of a plurality of network elements by flooding an assembly packet as recited in claim 46.

Claim 46 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Clare-Wesson in view of Myer. Claim 46 recites, *inter alia,* "organizing a plurality of network elements including a start node and at least one sensor node into a plurality of clusters by flooding an assembly packet from the start node to each network element in the plurality of network elements." The use of flooding an assembly packet throughout all nodes of the netowrk is described in the specification generally throughout, and specifically at least on page 50, lines 1-11 in the context of the algorithm disclosed on page 50, line 12 – page 51, line 32 of the specification.

As described above for claim 1, neither Clare nor Wesson disclose or suggest use of assembly packets or flooding assembly packets from a start node to each network element, to organize a plurality of network elements into a plurality of clusters, as recited in claim 46.

Myer discloses a system and method for device driver configuration. Myer, col. 1, lines 8-10. Myer describes a control network portal coupled between the Internet and one or more control area networks. Myer, col. 2, lines 42-54. The control area networks may include master controllers that are used to install and configure components in a control system. Myer, col. 2, lines 60-63 and col. 5, lines 26-45. The control area networks may use network connectivity that is "wired, wireless, power line carriers, or any suitable transmission medium." Myer, col. 2, lines 59-60.

When a new device connects to the control area network, the new device informs the master controller of the manufacturer name and device type. Myer, col. 6, lines 1-7. The master controller may retrieve a configuration file for the new device and then graphically display the configuration file for user control. Myer, col. 6, lines 12-49.

However, Myer does not cure the deficiencies of Clare and Wesson. Specifically, Myer fails to disclose or suggest, organizing a plurality of network elements including a start node and at least one sensor node into a plurality of clusters by flooding an assembly packet from the start node to each network element in the plurality of network elements." Applicant

therefore submits that claim 46 is allowable over Myer. Applicant therefore submits that claim 46 is allowable over the cited art and thus respectfully requests the Examiner withdraw the rejection of claim 46 under 35 U.S.C. § 103(a).

Each of claims 48, 49, 50, 51, 54, and 56 has been amended, using similar language to claim 46, to recite organization of a plurality of nodes or plurality of network elements into a plurality of clusters by flooding an assembly packet from a start node to all other nodes (or network elements) in the plurality of nodes (or network elements). Also, each of claims 48, 49, 50, 51, 54, and 56 were rejected by the Examiner relying on either the Clare-Wesson or Clare-Wesson-Myer combination. Applicant therefore submits that the each of claims 48, 49, 50, 51, 54, and 56 is allowable over the cited art, for at least the reasons presented for claims 1 and 46, and thus respectfully requests the Examiner withdraw the rejections of claims 48, 49, 50, 51, 54, and 56 under 35 U.S.C. § 103(a).

Further, Applicant submits that each of the claims is allowable for at least the reason that each dependent claim depends from an allowable base claim. Applicant therefore requests the Examiner withdraw the rejections of each of the dependent claims under 35 U.S.C. § 103(a).

3. As amended, the independent claims are no longer subject to the double patenting rejections made by the Examiner, as each independent claim in this application recites the use of flooding an assembly packet to organize a plurality of network elements or nodes into a plurality of clusters in a manner not specifically recited in the claims of the double patenting references.

The Examiner rejected claims 1-56 on the grounds of nonstatutory double patenting over the '701 claims, the '831 claims, the '251 claims, the '607 claims, the '387 claims, and the '706 claims. As described above, each independent claim in this application recites the use of flooding of an assembly packet to organize a plurality of network elements or nodes into a plurality of clusters. First, Applicant's review of the '251 claims, the '607 claims, and the '387 claims indicates that this element of flooding an assembly packet to organize a plurality of network element or nodes into a plurality of clusters is not recited in any of these three sets of claims.

Applicant notes that dependent claims 28-31 of the '701 Patent recite elements similar to those recited above. However, each of these claims ultimately depend from claim 1 of the '701 Patent, which recites, *inter alia*, "configuring the node at one of a plurality of programming layers through a plurality of application program interfaces (APIs)" Applicant submits that none of the independent claims of this application recite use of APIs. Therefore the claims of this application are patentably distinct from those of the '701 claims.

Similarly, dependent claims 27-30 of the '831 Patent recite elements similar to those recited above. However, the dependent claims 27-30 of the '831 Patent ultimately depend from claim 1 of the '831 Patent which recites, *inter alia*, "the node is configurable at one of a plurality of programming layers through a plurality of application program interfaces (APIs)". As none of the independent claims of this application recite use of APIs, the claims of this application are patentably distinct from those of the '831 claims.

Dependent claims 34-35 of the '706 Application and independent claim 106 of the '706 Application recites elements similar to those recited in the independent claims of this invention. However, both dependent claims 34-35 and independent claim 106 of the '706 Application recites a limitation "wherein information of the assembly packet alternates with each successive communication between directing a node to become a base node of a particular cluster number and directing a node to become a remote node of a particular cluster number" (quote from claim 34). Applicant submits that the direction of nodes as base nodes and remote nodes is not recited in the independent claims of this Application.

Applicant therefore submits that the claims of this Application are patentably distinct from each of the '701 claims, the '831 claims, the '251 claims, the '607 claims, the '387 claims, and the '706 claims. Applicant therefore respectfully requests the Examiner withdraw all rejections on the grounds of non-statutory double patenting.

Conclusion

In view of the foregoing, Applicant submits that all pending claims are allowable, and thus Applicant respectfully requests allowance of these claims. Should the Examiner wish to discuss this case, the Examiner is invited to call the undersigned at (312) 913-3338.

Respectfully submitted,

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Dated: December 8, 2008

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